

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 August 2002 (15.08.2002)

PCT

(10) International Publication Number
WO 02/062311 A1

(51) International Patent Classification⁷: **A61K 7/48**

MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(21) International Application Number: PCT/EP02/01035

(22) International Filing Date: 29 January 2002 (29.01.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0102647.5 2 February 2001 (02.02.2001) GB

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- of inventorship (Rule 4.17(iv)) for US only

Published:

- with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COSMETIC SKIN CARE PREPARATION COMPRISING DISPERSED HIGH VISCOSITY SILICONE HAVING A SMALL DROPLET SIZE

(57) Abstract: The use of a silicone-in-water emulsion in a cosmetic skin care reparation, wherein the dispersed silicone has a viscosity of at least, preferably more than 100 million mm²s⁻¹, and a droplet size of at most, preferably less than 1µm. A cosmetic skin care preparation which comprises a silicone-in-water emulsion as identified above.

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COSMETIC SKIN CARE PREPARATION COMPRISING DISPERSED HIGH VISCOSITY SILICONE
HAVING A SMALL DROPLET SIZE

[0001] The present invention relates to use of certain
silicone-in-water emulsions in a cosmetic skin care

5 preparation, for example a shower gel or facial cleanser.

[0002] Silicone-in-water emulsions are well known for use
in skin care preparations, see for example EP 0874017, EP
0893467, and EP 1013700. Silicone is lubricious, and
improves the properties of skin care preparations by

10 improving the feel of skin when deposited thereon. For
example, EP0874017 refers to how the silicone-in-water
emulsions disclosed therein are useable in personal care
applications. However, there is a need for cosmetic skin
care preparations which can provide still further improved
15 sensory performance when applied to skin, and at ever lower
silicone concentrations. This could for example be improved
by ensuring a larger proportion of the silicone is deposited
on the skin. It is also taught in EP0874017 that the
preferred silicone emulsions used have to have a silicone

20 viscosity range from $1.10^6 \text{mm}^2 \text{s}^{-1}$ to $1.10^8 \text{mm}^2 \text{s}^{-1}$ and a
particle size of from 1 to 100 μm . It has now surprisingly
been found that if the viscosity of the silicone is raised
higher and is used in combination with a particle size below
1 μm , better deposition can be achieved, without any loss of
25 essential properties of skin care compositions are
experienced.

[0003] According to the present invention there is
provided the use of a silicone-in-water emulsion in a
cosmetic skin care preparation, wherein the dispersed
30 silicone has a viscosity of at least, and preferably more
than 100 million $\text{mm}^2 \text{s}^{-1}$, and a droplet size of at most,

preferably less than $1\mu\text{m}$. (Herein all viscosities are measured at 25°C and atmospheric pressure).

[0004] Use of the above defined silicone-in-water emulsion in cosmetic skin care preparations according to the present invention can provide cosmetic skin care preparations which have improved foam generation, quality and/or quantity compared to conventional preparations, and improved sensory perception for the user, including improved cushion and wet feel, tackiness, smoothness, and/or suppleness of skin to which the preparation is applied. The amount of silicone required to achieve these results can surprisingly be lower than in conventional preparations, as the silicone is perceived by the user on the skin at lower active levels.

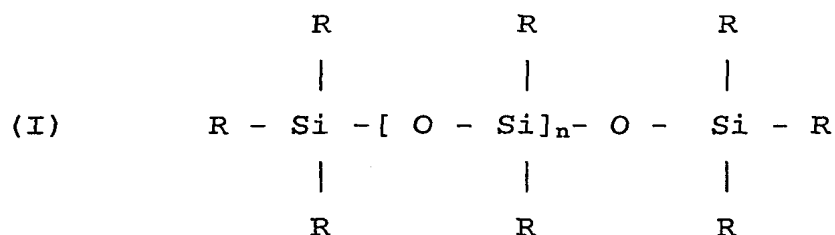
[0005] According to the present invention there is also provided a cosmetic skin care preparation which comprises a silicone-in-water emulsion, wherein the dispersed silicone has a viscosity of at least, preferably greater than 100 million mm^2s^{-1} , and a particle size of at most, preferably less than $1\mu\text{m}$.

[0006] The silicone-in-water emulsion used in the present invention may be prepared by the method disclosed in EP 0874017, which publication is incorporated herein by reference. In summary, this method comprises a) mixing materials comprising a composition containing at least one polysiloxane, at least one organosilicon material which reacts with said polysiloxane by a chain extension reaction, a metal containing catalyst for said chain extension reaction, at least one surfactant, and water to form a mixture, and b) emulsifying the mixture. This method provides a route to silicone-in-water emulsions having a wide range of physical characteristics, in particular

emulsions wherein the dispersed silicone has a high viscosity and low droplet size.

[0007] Chain extension reactions with polysiloxanes are known in the art and can involve, for instance, the hydrosilylation reaction in which an Si-H reacts with an aliphatically unsaturated group in the presence of a platinum or rhodium-containing catalyst. Alternatively, the reaction can involve the reaction of an Si-OH group (e.g. a hydroxy-terminated polysiloxane) with an alkoxy group (e.g. alkoxy-silanes, silicates or alkoxy-siloxanes) in the presence of a metal containing catalyst. Other reactions can involve that between an Si-OH group with a CH₃COOSi- group in the presence of water, the reaction of an SiOH group with R₂C=NOSi, or the reaction of SiOH with an SiH group in the presence of a metal containing catalyst.

[0008] The polysiloxane(s) used in the chain extension reactions described above generally comprises a substantially linear polymer of the structure:



In this structure, each R independently represent a hydrocarbon group having up to 20 carbon atoms such as an alkyl group (e.g., methyl, ethyl, propyl or butyl), an aryl group (e.g., phenyl), or the group required for the chain extension reaction described above ("reactive group", e.g., hydrogens, aliphatically unsaturated groups such as vinyl, allyl or hexenyl, hydroxy, alkoxy such as methoxy, ethoxy or

propoxy, alkoxy-alkoxy, acetoxy, amino and the like), provided that on average there is between one and two reactive groups (inclusive) per polymer, and n is a positive integer greater than one. Preferably, a majority, more preferably >90%, and most preferably >98% of the reactive groups are end-groups.

[0009] Preferably n is an integer which results in polysiloxanes with viscosities between about 1 and about 1 million mm^2s^{-1} .

10 [0010] If desired, the polysiloxane (I) can have a small amount of branching (e.g., less than 2 mole % of the siloxane units) without affecting the invention, i.e., the polymers are "substantially linear". Moreover, if desired, the R groups can be substituted with, for example, nitrogen
15 containing groups (e.g., amino groups), epoxy groups, sulphur containing groups, silicon containing groups, oxygen containing groups and the like. Preferably, however, at least 80% of the R groups are alkyl and, more preferably, the alkyl groups are methyl groups.

20 [0011] The organosilicon material which reacts with the polysiloxane by a chain extension reaction can be either a second polysiloxane or a material which acts as a chain extension agent. If the organosilicon material is a polysiloxane then it too will generally have the structure
25 described above (I). In such a situation one polysiloxane in the reaction will comprise one reactive group and the second polysiloxane will comprise a second reactive group which reacts with the first.

[0012] If the organosilicon material comprises a chain
30 extension agent, it can be a material such as a silane, a siloxane (e.g., disiloxane or trisiloxane) or a silazane. For example, a composition comprising a polysiloxane

according to the above structure (I) which has at least one Si-OH group can be chain extended by using an alkoxysilane (e.g., a dialkoxysilane or trialkoxysilane) in the presence of a tin or titanium containing catalyst.

5 **[0013]** The metal containing catalysts used in the above described chain extension reactions are often specific to the particular reaction. Such catalysts, however, are known in the art. Generally, they are materials containing metals such as platinum, rhodium, tin, titanium, copper, lead, etc.

10 **[0014]** In a preferred chain-extension reaction, a polysiloxane having at least one aliphatically unsaturated group, preferably an end group, is reacted with an organosilicon material which is a siloxane or a polysiloxane having at least one Si-H group, preferably an end group, in
15 the presence of a hydrosilylation catalyst. The polysiloxane having at least one aliphatically unsaturated group has the structure (I) wherein R and n are as defined above and provided that on average between one and two (inclusive) R groups comprise an aliphatically unsaturated
20 group per polymer. Representative aliphatically unsaturated groups include vinyl, allyl, hexenyl and cyclohexenyl or a group $R''CH=CHR'$, where R'' represents a divalent aliphatic chain linked to the silicon atom and R' represents a hydrogen atom or an alkyl group. The organosilicon material
25 having at least one Si-H group preferably has the above structure (I) wherein R and n are as defined above and provided that on average between one and two (inclusive) R groups comprise hydrogen atoms and n is 0 or a positive integer. This material can be a polymer or a lower
30 molecular weight material such as a siloxane (e.g. a disiloxane or a trisiloxane).

[0015] The polysiloxane having at least one aliphatically unsaturated group and the organosilicon material having at least one Si-H group react in the presence of a hydrosilylation catalyst. Such catalysts are known in the art and include, for example, platinum and rhodium-containing materials. These catalysts may take any of the known forms, such as platinum or rhodium deposited on carriers such as silica gel or powdered charcoal, or other appropriate compounds such as platonic chloride, salts of platinum and chloroplatinic acids. A preferred material is chloroplatinic acid either as the commonly obtainable hexahydrate or the anhydrous form because of its easy dispersibility in organosilicon systems and its non-effect on colour of the mixture. Platinum or rhodium complexes may also be used, for example those prepared from chloroplatinic acid hexahydrate and divinyltetramethyldisiloxane. Generally, these catalysts are used in amounts of between about 0.0001 and 10 wt. % based on the weight of the composition (I).

[0016] In a second preferred chain extension reaction, a polysiloxane having at least one Si-OH group, preferably an end group, is reacted with an organosilicon material having at least one alkoxy group, preferably a siloxane having at least one Si-OR group, or an alkoxysilane having at least two alkoxy groups in the presence of a metal containing catalyst. In this case, the polysiloxane having at least one SiOH group has the structure (I) wherein R and n are as defined above and on average between one and two (inclusive) R groups comprise a hydroxyl group (OH). The organosilicon material having at least one alkoxy group can have the structure (II) wherein R and n are as defined above and on average between one and two (inclusive) R groups comprise

alkoxy groups, e.g., of the structure (OR) in which R is as defined above and n is 0 or a positive integer.

Alternatively, the organosilicon material can be a silane of the structure $R_m\text{Si}(\text{OR})_{4-m}$, wherein R is as defined above and m is 0 to 2. Other materials containing the alkoxy group (e.g., alkoxy- alkoxy) may also be used.

[0017] A variety of metal catalysts for the reaction of an Si-OH group with an Si-OR group are known in the art and may be employed including, for example, organic metal compounds such as organotin salts, titanates, or titanium chelates or complexes. Examples include stannous octoate, dibutyltin dilaurate, dibutyltin diacetate, dimethyltin dineodecanoate, dibutyltin dimethoxide, isobutyl tin triceroate, dimethyltin dibutyrate, dimethyltin dineodecanoate, triethyltin tartrate, tin oleate, tin naphthenate, tin butyrate, tin acetate, tin benzoate, tin sebacate, tin succinate, tetrabutyl titanate, tetraisopropyl titante, tetraphenyl titante, tetraoctadecyl titanate, titanium naphthanate, ethyltriethanolamine titante, titanium diiso-propyl diethyl acetoacetate, titanium diisopropoxy diacetyl acetate, and titanium tetra alkoxides where the alkoxide is butoxy or propoxy. Generally, these catalysts are used in amounts of between about 0.001 and 10 wt. % based on the weight of the composition (I).

[0018] Although a limited number of compounds are exemplified, any composition containing at least one polysiloxane, at least one organosilicon material which reacts with said polysiloxane by a chain extension reaction, and a metal containing catalyst for said chain extension reaction can be used for the chain extension reaction.

[0019] The mixture used to form the emulsion also contains at least one surfactant. This can be a non-ionic

surfactant, a cationic surfactant, an anionic surfactant, alkylpolysaccharides, amphoteric surfactants and the like.

[0020] Examples of non-ionic surfactants include polyoxyalkylene alkyl ethers, polyoxyalkylene sorbitan
5 alkyl esters, polyoxyalkylene alkyl esters, and polyoxyalkylene alkylphenol ethers, polyethylene glycols, polypropylene glycols, and diethylene glycols.

[0021] Examples of cationic surfactants include quaternary ammonium hydroxides such as tetramethylammonium
10 hydroxide, octyltrimethylammonium hydroxide, dodecyltrimethyl ammonium hydroxide, hexadecyltrimethyl ammonium hydroxide, octyldimethylbenzylammonium hydroxide, decyldimethylbenzyl ammonium hydroxide, didodecyldimethyl ammonium hydroxide, dioctadecyl dimethylammonium hydroxide,
15 tallow trimethylammonium hydroxide and cocotrimethylammonium hydroxide as well as corresponding salts of these materials, fatty acid amines and amides and their derivatives and the salts of the fatty acid amines and amides including aliphatic fatty amines and their derivatives, homologs of
20 aromatic amines having fatty chains, fatty amides derived from aliphatic diamines, fatty amides derived from disubstituted amines, derivatives of ethylene diamine, amide derivatives of amino alcohols, amine salts of long chain fatty acids, quaternary ammonium bases derived from fatty
25 amides of disubstituted diamines quaternary ammonium bases of benzimidazolines, basic compounds of pyridinium and its derivatives, sulfonium compounds, quaternary ammonium compounds of betaine, urethanes of ethylene diamine, polyethylene diamines and polypropanolpolyethanol amines.

30 [0022] Examples of suitable anionic surfactants include alkyl sulfates such as lauryl sulfate, polymers such as acrylates/C₁₀₋₃₀ alkyl acrylate crosspolymer

alkylbenzenesulfonic acids and salts such as
hexylbenzenesulfonic acid, octylbenzenesulfonic acid,
decylbenzenesulfonic acid, dodecylbenzenesulfonic acid,
cetylbenzenesulfonic acid and myristylbenzenesulfonic acid;
5 the sulfate esters of monoalkyl polyoxyethylene ethers;
alkylnaphthylsulfonic acid; alkali metal sulforecinates,
sulfonated glyceryl esters of fatty acids such as sulfonated
monoglycerides of coconut oil acids, salts of sulfonated
monovalent alcohol esters, amides of amino sulfonic acids,
10 sulfonated products of fatty acid nitriles, sulfonated
aromatic hydrocarbons, condensation products of naphthalene
sulfonic acids with formaldehyde, sodium octahydroanthracene
sulfonate, alkali metal alkyl sulfates, ester sulfates, and
alkarylsulfonates.

15 **[0023]** Examples of suitable alkylpolysaccharides include,
for example, materials of the structure $R^1-O-(R^2O)_x-(G)_y$
wherein R^1 represents a linear or branched alkyl group, a
linear or branched alkenyl group or an alkylphenyl group, R^2
represent an alkylene group, G represents a reduced sugar, x
20 denotes 0 or a positive integer and y denotes a positive
integer as described, for example, in US Patent 5,035,832.

[0024] Examples of suitable amphoteric surfactants
include cocamidopropyl betaine and cocamidopropyl
hydroxysulfate.

25 **[0025]** The above surfactants may be used individually or
in combination.

[0026] Further details of preferred polysiloxanes,
organosilicon materials, catalysts, surfactants, additional
ingredients (e.g. cosmetic additives) and methods for making
30 the emulsion employed in the present invention are more
fully disclosed in EP 0874017.

[0027] The dispersed silicone in the emulsion used in the present invention has a viscosity of at least, preferably more than 100 million mm^2s^{-1} , more preferably at least 150 million mm^2s^{-1} , most preferably at least 170 million mm^2s^{-1} , and a droplet size of at most, preferably less than $1\mu\text{m}$, more preferably $0.5\mu\text{m}$ or less.

[0028] The emulsion preferably comprises at least 50% wt. silicone, more preferably at least 60 wt. %, even more preferably 75 wt. %.

10 [0029] The emulsion is preferably incorporated in a skin care preparation in an amount which provides at least 1% silicone by weight of the skin care preparation, for example 1 to 10% by weight, (e.g. 2 to 6% wt.). Skin care preparations are well known in the art, and typically
15 comprise a washing base containing surfactants, and other agents for improving the cosmetic properties of the preparation. Examples include personal wash preparations, shower gels, personal and facial cleansers, skin lotions, skin creams, skin care lotions, moisturisers, sera, facial
20 treatments such as acne or wrinkle removers, bath oils, sunscreens, pre-shave and after shave lotions, shaving soaps and shaving lathers. The washing base typically comprises a cosmetically acceptable aqueous medium, which may be solely water, or water with a solvent (for example, a lower alcohol
25 or alkylene glycol). The surfactants may be anionic, non-ionic, cationic or amphoteric. Other additives which may be included in the preparation include pH adjusters (for example, amines), viscosity regulators, electrolytes or thickeners, pearlising or opacifying agents, foam
30 synergists, and other agents for improving the cosmetic properties of the preparation, for example anionic, non-ionic and cationic polymers, proteins, fatty acids and

vitamins. The cosmetic skin care preparation will typically be in the form of a thickened liquid, cream or gel.

[0030] It is particularly surprising that the combination of such high viscosity of the emulsified silicones with such low particle size results in the greater deposition, without negatively affecting the sensory benefits of a deposited silicones. Indeed in several cases it was found that tackiness was reduced, in spite of the fact that a higher viscosity silicone material was deposited.

10 [0031] The present invention will now be illustrated by way of example. All parts are parts and percentages are by weight.

Example 1

15 [0032] Various silicone-in-water emulsions having different physical properties (defined in Examples 3 to 9 below) were made according to the method described in EP 0874017, using the following components:

60 parts dimethylvinyl-terminated polydimethylsiloxane
20 having a viscosity of $55,000 \text{ mm}^2\text{s}^{-1}$.
0.012 parts platinum catalyst.
1.65 parts of polyoxyethylene (4) lauryl ether.
2.04 parts polyoxyethylene (23) lauryl ether.
0.75 parts of dimethylhydrogen-terminated.
25 polydimethylsiloxane having a viscosity of $10 \text{ mm}^2\text{s}^{-1}$.
0.05 parts of Glydant Plus preservative.
35.5 parts water.

Example 2

30 [0033] Shower gel and facial cleanser preparations were prepared incorporating silicone-in-water emulsion prepared

according to Example 1 above, each having the following formulations:

Shower gel - 10.0% sodium laureth sulphate

2.5% decyl glucoside

5 4.0% cocamidopropyl betaine

2.0% laureth - 4

2.0% viscosifier (Sepigel)

2-5% silicone (active, not total emulsion)

Up to 100% water

10 q.s. NaCl

Facial cleanser - 2.0% sodium laureth sulphate

5.0% cocamidopropyl betaine

2.3% sodium cocoamphopropionate

4.0% sodium lauroyl sarcosinate

15 0.4% acrylates/C10-30 acrylates
copolymers

5.0% silicone (active, not total
emulsion)

Up to 100% water

20 NaCl q.s.

[0034] To test how varying the physical properties of the
silicone-in-water emulsion effects the sensory performance
of the shower gel and facial cleanser prepared according to
25 the formulations above, tests were performed as follows.

[0035] Six test subjects washed their hands with each
shower gel and facial cleanser, and, for comparison, with a
control preparation (i.e. identical shower gel and facial
cleanser not containing any silicone). The subjects were
30 then asked to give each shower gel and facial cleanser
(including the control) a rating from 1 (low) to 10 (high)
for performance in the following categories; foam

generation, foam quality, foam quantity, cushion feel, wet feel, tackiness, smoothness, film presence, and suppleness. The average rating for performance of each shower gel and facial cleanser in each category was calculated, and
5 compared to the control preparation.

Example 3 - effect of silicone viscosity

[0036] Three silicone-in-water emulsions were prepared according to Example 1 above, a first having a silicone
10 viscosity of 5 million mm^2s^{-1} , a second having a silicone viscosity of 50 million mm^2s^{-1} , and a third having a silicone viscosity of 170 million mm^2s^{-1} . In each case the silicone droplet size was $0.4\mu\text{m}$. Shower gels were then prepared according to the formulation in Example 2 above,
15 each shower gel containing 5% by weight of active silicone. The shower gels were then tested as described in Example 2 above, and the test results are given in Table 1 below.

Table 1			
	Difference vs. control (rating out of ten)		
Test	$5 \times 10^6 \text{ mm}^2 \text{s}^{-1}$	$50 \times 10^6 \text{ mm}^2 \text{s}^{-1}$	$170 \times 10^6 \text{ mm}^2 \text{s}^{-1}$
Foam generation	+0.2	+1.0	+0.3
Foam quality	+1.0*	+1.6**	+0.8**
Foam quantity	+0.2	+0.3	-0.2
Cushion feel	+0.8*	-0.2	+0.3
Wet feel	-0.5*	-0.7*	+0.5
Tackiness	+0.8	+1.0	-0.3
Smoothness	+0.7	+1.5**	+1.5**
Film presence	+0.7*	-0.7	+0.5
Suppleness	+0.5*	+1.5*	+1.0**

N.B. In Table 1, and the following Tables, * indicates an 80% agreement between the test subjects, and ** indicates a 95% agreement between the test subjects.

Example 4 - effect of silicone droplet size

[0037] Three silicone-in-water emulsions were prepared according to Example 1 above, a first having a silicone droplet size of $0.4 \mu\text{m}$, a second having a silicone droplet size of $4 \mu\text{m}$, and a third having a droplet size of $40 \mu\text{m}$. In each case the silicone viscosity was $170 \text{ million mm}^2 \text{s}^{-1}$. Shower gels were then prepared according to the formulation in Example 2 above, each shower gel containing 5% by weight of active silicone. The shower gels were then tested as described in Example 2 above, and the test results are given in Table 2 below.

Table 2			
	Difference vs. control (rating out of ten)		
Test	0.5 μ m	4 μ m	40 μ m
Foam generation	+0.3	+0.8**	-0.4
Foam quality	+0.8**	-0.4	0
Foam quantity	-0.2	+0.6	-0.4
Cushion feel	+0.4	+1.0	0
Wet feel	+0.6*	+0.8*	-0.6
Tackiness	-0.4	+0.8	+0.2
Smoothness	+1.4**	+1.0*	0
Film presence	+0.5*	+0.1*	+0.5*
Suppleness	+1.0**	+0.6	+0.1

Example 5 - effect of surfactant system

[0038] Three silicone-in-water emulsions were prepared according to Example 1 above, with the exception that the first emulsion contained anionic surfactant sodium C₁₄₋₁₆ olefin sulphonate, the second contained non-ionic surfactant poly(EO) mono lauryl ether, and the third cationic surfactant hexadecyltrimethylammonium chloride. In each case the silicone droplet size was 0.4 μ m and the silicone viscosity was 170 million mm²s⁻¹. Shower gels were then prepared according to the formulation in Example 2 above, each shower gel containing 5% by weight of active silicone. The shower gels were then tested as described in Example 2 above, and the test results are given in Table 3 below.

Table 3			
	Difference vs. control (rating out of ten)		
Test	Anionic	Non-ionic	Cationic
Foam generation	+0.4	0	+0.4
Foam quality	+0.8**	+1.6**	+1.8**
Foam quantity	-0.2	+0.8	0
Cushion feel	+0.3	+1.5*	+1.0*
Wet feel	+0.5*	+0.8	+0.3*
Tackiness	-0.4	+0.1	-0.5
Smoothness	+1.5**	+1.3**	+1.0**
Film presence	+0.5*	+1.2*	+0.1
Suppleness	+1.0**	+1.5**	+1.2**

Example 6 - effect of amount of silicone

[0039] A silicone-in-water emulsion was prepared

5 according to Example 1 above having a silicone droplet size of $0.4\mu\text{m}$ and silicone viscosity was $170\text{ million mm}^2\text{s}^{-1}$.

Three shower gels were then prepared according to the formulation in Example 2 above, the first shower gel containing 2% by weight of active silicone, the second

10 containing 3% active silicone, and the third containing 5%.

The shower gels were then tested as described in Example 2 above, and the test results are given in Table 4 below.

Table 4			
Difference vs. control (rating out of ten)			
Test	2% silicone	3% silicone	5% silicone
Foam generation	+0.1	+0.1	0
Foam quality	+1.8**	+1.7**	+1.7**
Foam quantity	0	+0.2	+0.8
Cushion feel	0	+1.0*	+1.5*
Wet feel	+0.8	+0.7	+0.8*
Tackiness	+0.3	+0.6	+0.2
Smoothness	+1.0*	+1.3**	+1.3**
Film presence	0	+0.5	+1.2*
Suppleness	+1.3*	+1.3**	+1.5**

Example 7 - non-ionic vs. anionic surfactant

[0040] Two silicone-in-water emulsions were prepared

5 according to Example 1 above, with the exception that the first contained anionic surfactant (control), sodium C₁₄₋₁₆ olefin sulphonate, and the second contained non-ionic surfactant polyol (EO) mono lauryl ether. In both emulsions the silicone droplet size was 0.4 μ m and silicone viscosity

10 was 170 million mm²s⁻¹. Two shower gels were then prepared according to the formulation in Example 2 above with 5 % silicone active level. The shower gels were then tested as described in Example 2 above, using the anionic surfactant containing shower gel as the control, and the test results

15 are given in Table 5 below.

Table 5	
Test	Difference vs. control (anionic surfactant) (rating out of ten)
Foam generation	+0.1
Foam quality	+1.4**
Foam quantity	+1.2**
Cushion feel	+1.0*
Wet feel	+0.1
Tackiness	+0.7*
Smoothness	+0.8**
Film presence	+0.5
Suppleness	+0.8**

Example 8 - FTIR measurement of skin deposition

[0041] Four silicone-in-water emulsions were prepared
 5 according to Example 1 above, two having a silicone
 viscosity of 170 million mm^2s^{-1} , and two having a silicone
 viscosity of 5 million mm^2s^{-1} . For each silicone viscosity,
 one emulsion had a silicone droplet size of $0.5\mu\text{m}$, and the
 other a silicone droplet size of $40\mu\text{m}$. Four shower gels
 10 were then prepared according to the formulation in Example 2
 above. FTIR measurements were made to determine the amount
 of silicone deposition on their skin by the following
 procedure. An IR scan of the forearm of each test subject
 was made to establish a control value. Each forearm was
 15 then treated with the shower gels and rescanned. The
 quantity of silicone deposited on the forearm is
 proportional to the ratio of the area under the silicone
 peak at 1260 cm^{-1} to the area under the skin amide peak II
 at 1540 cm^{-1} . The test results are given in Table 6 below.

Table 6		
Silicone viscosity	Droplet size	Silicone peak ratio
$5 \times 10^6 \text{ mm}^2\text{s}^{-1}$	$0.5\mu\text{m}$	0.31
$5 \times 10^6 \text{ mm}^2\text{s}^{-1}$	$40\mu\text{m}$	0.07
$170 \times 10^6 \text{ mm}^2\text{s}^{-1}$	$0.5\mu\text{m}$	0.17
$170 \times 10^6 \text{ mm}^2\text{s}^{-1}$	$40\mu\text{m}$	0.06

Example 9 - performance in facial cleanser

- 5 **[0042]** A silicone-in-water emulsion were prepared according to Example 1 above, having a silicone viscosity of 170 million mm^2s^{-1} and a silicone droplet size of $0.4\mu\text{m}$. A facial cleanser was then prepared according to the formulation in Example 2 above, together with a control
- 10 cleanser (containing no silicone) for comparison. The facial cleanser was then tested as described in Example 2 above, and the test results are given in Table 7 below.

Table 7	
Test	Difference vs. control (rating out of ten)
Foam generation	+0.65*
Foam quality	+0.8
Foam quantity	+0.3
Cushion feel	+0.5
Wet feel	+0.2
Tackiness	+0.5
Smoothness	+0.8*
Film presence	+0.8**
Suppleness	+0.8**

CLAIMS

1. Use of a silicone-in-water emulsion in a cosmetic skin care preparation, wherein the dispersed silicone has a viscosity of greater than 100 million mm^2s^{-1} , and a particle size of less than $1\mu\text{m}$.
2. Use according to Claim 1, wherein the dispersed silicone has a viscosity of at least 170 million mm^2s^{-1} .
3. Use according to Claim 1 or 2, wherein the dispersed silicone has a droplet size of $0.5\mu\text{m}$ or less.
4. Use according to any preceding Claim, wherein the skin care preparation is a shower gel.
5. Use according to any one of Claims 1 to 3, wherein the skin care preparation is a facial cleanser.
6. A cosmetic skin care preparation which comprises a silicone-in-water emulsion, wherein the dispersed silicone is as defined in any preceding Claim.
7. A method for enhancing the sensory perception of skin, which method comprises applying a cosmetic skin care preparation according to Claim 6 to the skin.

INTERNATIONAL SEARCH REPORT

International Application No.

EP 02/01035

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K7/48

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61K C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 874 017 A (DOW CORNING SA) 28 October 1998 (1998-10-28) cited in the application page 5, line 35 - line 57; claims 15-17 ---	1-7
A	EP 1 013 700 A (DOW CORNING SA) 28 June 2000 (2000-06-28) cited in the application page 2, line 39 - line 44 page 5, line 4 - line 7 page 5, line 19 - line 29; claim 10 ---	1-7
P, X	EP 1 108 416 A (OREAL) 20 June 2001 (2001-06-20) page 3, line 3 - line 47; claims 1-5, 19 page 2, line 32 - line 33 page 2, line 54 - line 55 -----	1-7

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

21 May 2002

Date of mailing of the international search report

29/05/2002

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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